

We Claim:

1. A vacuum cleaner comprising:

5 (a) a dirty air inlet for receiving air containing dirt;

(b) a clean air outlet spaced for the dirty air inlet;

(c) an air flow path extending downstream from the dirty air inlet to the clean air outlet; and,

10 (d) a filtration assembly positioned in the air flow path, the filtration assembly comprising:

(i) at least one cyclonic cleaning stage in flow communication with the dirty air inlet and having a partially cleaned air outlet; and,

15 (ii) at least one electrostatic precipitator positioned in the air flow path downstream from the at least one cyclonic cleaning stage and upstream of the clean air outlet; and,

20 (e) an on board power source comprising at least one battery for operating the vacuum cleaner.

25 2. The vacuum cleaner as claimed in claim 1 wherein the at least one cyclonic cleaning stage comprises at least a first cyclonic cleaning stage and a second cyclonic cleaning stage downstream from the first cyclonic cleaning stage.

30 3. The vacuum cleaner as claimed in claim 2 wherein the at least one electrostatic precipitator is positioned in the air flow path downstream from the first cyclonic cleaning stage and upstream of the second cyclonic cleaning stage.

4. The vacuum cleaner as claimed in claim 2 wherein the at least one electrostatic precipitator is positioned in the air flow path downstream from the second cyclonic cleaning stage and upstream of the

clean air outlet.

5. The vacuum cleaner as claimed in claim 3 wherein the first cyclonic cleaning stage comprises one cyclone and the second cyclonic 5 cleaning stage consists of from two to five second cyclones.

6. The vacuum cleaner as claimed in claim 3 wherein the second cyclonic cleaning stage removes particulate material larger than that which is removed by the at least one electrostatic precipitator.

10 7. The vacuum cleaner as claimed in claim 1 wherein the at least one cyclonic cleaning stage comprises a cyclone chamber removably mounted in a housing and the at least one electrostatic precipitator comprises an electrostatic precipitator removably mounted in the cyclone 15 chamber.

20 8. The vacuum cleaner as claimed in claim 7 wherein the cyclone chamber has an air outlet and the electrostatic precipitator is positioned in the air outlet of the cyclone chamber.

25 9. The vacuum cleaner as claimed in claim 7 wherein the cyclone chamber has an air outlet and the electrostatic precipitator is removably mounted in the air outlet of the cyclone chamber.

10. A vacuum cleaner for receiving and cleaning a dirty air stream to obtain clean air comprising:

- (a) first means for cyclonically treating the dirty air stream to obtain a partially cleaned air stream;
- (b) electrostatic precipitation means positioned downstream from the first means for cyclonically treating a dirty air stream; and,
- (c) an on board power supply means comprising battery means for operating the vacuum cleaner.

11. The vacuum cleaner as claimed in claim 10 further comprising second means for further cyclonically treating the dirty air stream positioned downstream from the first means for cyclonically treating a dirty air stream.

12. The vacuum cleaner as claimed in claim 11 wherein the electrostatic precipitation means is positioned in the air flow path downstream from the first means for cyclonically treating the dirty air stream and upstream of the second means for further cyclonically treating the dirty air stream.

13. The vacuum cleaner as claimed in claim 11 wherein the electrostatic precipitation means is positioned in the air flow path downstream from the second means for further cyclonically treating the dirty air stream and upstream of the clean air outlet.

14. The vacuum cleaner as claimed in claim 11 wherein the second means for further cyclonically treating the dirty air stream removes particulate material larger than that which is removed by the electrostatic precipitation means.

15. The vacuum cleaner as claimed in claim 10 wherein the first means for cyclonically treating the dirty air stream is removably mounted in a housing and the electrostatic precipitation means is removably mounted with the first means for cyclonically treating the dirty air stream.

16. The vacuum cleaner as claimed in claim 10 wherein the first means is removably mounted in the vacuum cleaner.

17. An electrostatic precipitator for separating chargeable particulate matter from a fluid stream comprising:

5 (a) a housing having at least one fluid inlet and at least one fluid outlet;

5 (b) at least one member movably positioned in the housing for generating a high voltage potential in response to the movement of the at least one member in the housing; and,

10 (c) a conductive member for transmitting the high voltage potential to particulate matter entrained in the fluid whereby particulate matter is oppositely charged to the at least one member prior to encountering the at least one member and is attracted to the at least one member during passage of the charged particulate matter through the housing.

15 18. The electrostatic precipitator as claimed in claim 17 further comprising a directing member to cause the fluid to rotate the at least one member.

20 19. The electrostatic precipitator as claimed in claim 17 wherein the at least one member and at least a portion of the housing is constructed from a material that will produce a potential difference between the at least one member and the portion of the housing due to frictional contact of the at least one member with the housing as the at least one member moves in the housing due to the flow of fluid through the housing.

25 20. An electrostatic precipitator for separating chargeable particulate matter from a fluid stream comprising:

30 (a) housing means having fluid inlet means and fluid outlet means;

(b) individual chargeable means movably positioned in the housing means for generating a high voltage potential in response to the movement of the individual chargeable means in the housing means; and,

(c) conductive means for transmitting the high voltage

5 potential to particulate matter entrained in the fluid whereby particulate matter is oppositely charged to the individual chargeable means prior to encountering the individual chargeable means and is attracted to the individual chargeable means during passage of the charged particulate matter through the housing means.

10 21. The electrostatic precipitator as claimed in claim 20 further comprising a directing means to cause the fluid to rotate the individual chargeable means.

15 22. The electrostatic precipitator as claimed in claim 21 wherein the individual chargeable means and at least a portion of the housing means is constructed from a material that will produce a potential difference between the individual chargeable means and the portion of the housing means due to frictional contact of the individual chargeable means with the housing means as the individual chargeable means moves in the housing means due to the flow of fluid through the housing means.

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